REMARKS

Claims 2-8, 10-14, and 16-22 are now in the application. No claims have been amended by this Response. No new matter has been added.

Applicants appreciate the courtesies extended by Examiner Nolan to Applicants' representative during the July 23, 2010 telephone interview. The following remarks constitute Applicants' separate Statement of the Substance of Interview.

Claims 2-8, 10-14, and 16-22 are rejected under 35 USC §103(a) as being unpatentable over the article in Eur. J. Org. Chem. 2001, 3871-3877 to Jackstell et al.in view of WO02/083695 to Ahlers et al., as evidenced by its counterpart US Patent No. 7,173,138, US Patent No. 5,731,472 to Leung et al., US Patent No. 4,567,306 to Dennis et al., US Patent No. 4,260,828 to Morrell et al., US Patent No. 4,283,562 to Billig et al., the article "Rhodium Catalyzed Hydroformylation" in chapter 9 of volume 22 of "Catalysis by Metal Complexes" to van Leeuwen, the article in J. Am. Chem. Soc. 1995, 117, 7696-7710, to Trzeciak et al., and the article in Tetrahydron Lett. 1997, 38(42), 7337-7340, to Xu et al.

Independent claim 13 recites, among other features, bringing the fluid into contact with at least one base selected from trialkyl amines, dialkyaryl amines, alkyldiaryl amines, triaryl amines, and bases immobilized on a solid phase, or a combination thereof. Similar subject matter is recited in independent claims 21 and 22.

As discussed during the July 23 telephone interview, Applicants' disclosure provides evidence of unexpected results. For example, and without limiting the general applicability of the claimed subject matter, comparative example 13 at page 44 and example 14 at pages 44 and 45 demonstrate that the claimed method provides for a stabilization, such that after 40 days in steady state operation 2150 ppm from an initial 7740 ppm of ligand (1) were still present. By contrast, in comparative example 13 without stabilization, no ligand (1) could be detected after only 8 days.

Moreover, Applicants respectfully submit that a stabilization of a catalyst is only one benchmark for evaluating a catalytic process. Applicants' disclosure describes, in great detail, how the claimed method allows to virtually retain the catalytic activity of a catalyst compared to a method without stabilization. For example, the conversion, yield and proportion of n product of example 4 at page 38 are 30%, 28%, and 94%, respectively. By contrast, the conversion, yield and proportion of n product of comparative example 2 at page 37 are 32%, 31%, and 93%, respectively. Thus, while the conversion and yield are slightly below the comparative example, the activity is sufficiently high to perform the claimed process on an industrial scale.

By contrast, Jackstell suggests, at page 3871, col. 2, second paragraph, that Leeuwen described a catalyst having advantages in terms of stability. However, the dibenzophospholyl- and phenoxaphosphanyl-substituted xanthene ligands give linear aldehydes at rates too low for industrial applications. Thus, a skilled artisan is apprised that a stabilization of a catalyst may severely impact the catalyst activity.

Accordingly, even if a skilled artisan would have combined the applied citations as suggested in the Office Action, the skilled artisan could not have predicted that the combination results in catalysts that are not only more stable, but also have catalytic activities that rival those of the catalysts without stabilization.

The Office Action asserts that some of the pyrrolyl-type phosphanes suggested at page 3872, col. 1, Scheme 2, of Jackstell are within the scope of independent claim 21. Further, the Office Action relies on Dennis for suggesting stabilizing hydroformylation catalysts with triethylamine as base.

The Office Action states that it is known to employ catalysts with phosphoramidite ligands for hydroformylation processes, as described by Jackstell or Ahlers. Incidentally, Jackstell mentions at page 3871, right column, second paragraph that because of the limited stability of known sterically hindered chelating phosphites there is interest in new hydroformylation catalysts. This does of course only mean that the new ligands should be stable and not that there is a demand for new additives to improve the stability of such ligands. The

main concern of Jackstell is the regioselectivity of the ligands and not a method to improve their stability. Thus, a person of ordinary skill in the art would not rely on Jackstell or Ahlers as a starting point to provide a new method to improve the stability of phosphoramidite ligands.

Leurig suggests the stabilization of organopolyphosphite ligand complex catalysts, which can be employed in a hydroformylation with heterocyclic nitrogen compounds. Phosphoramidite ligands and phosphite ligands are structurally different and it was not obvious for a person skilled in the art to employ the nitrogen compounds of claim 21 of the above-identified patent application for the stabilization of phosphoramidite ligands. Moreover, as taught at page 5, lines 9-19 of Applicants' disclosure, it is surprising that those catalysts can be stabilized with bases against degradation of the ligands or deactivation of the catalysts as the ligands themselves already contain more or less basic nitrogen-containing groups. This could not have been expected in view of the teaching of Leung, as the phosphite ligands disclosed in this document do not contain any basic groups and the employed heterocycles are also different from the bases used according to the instant claims.

Dennis suggests a hydroformylation process with a catalyst on the basis of known cyclic phosphite ligands that are already mentioned in Jackstell as having limited stability. However, there is no incentive for the skilled artisan employ tertiary amines in the method of Dennis to stabilize phosphoramidite ligands.

Dennis suggests cyclic phosphite ligands for ligand:Rh complex catalysts, but fails to suggests phosphoramidite compounds as claimed. At page 4, first full paragraph, the Office Action asserts that Dennis does not purport to be limited to phosphite ligands, but that adding triethylamine would be useful in providing stability in hydroformylation processes generally.

During the July 23 telephone interview, Applicants' representative noted that due to the unpredictability of the chemical arts, a skilled artisan is not apprised as to what effect triethylamine may or may not have when used in a different catalyst system.

Dennis, however, suggests, at col. 4, lines 52-54, that base plays no further role in halogen ligand containing catalysts once the base has caused an inhibition period to disappear. Thus, a skilled artisan learns from Dennis that going to a different catalyst system does not necessarily retain the benefits of employing triethylamine with phosphite ligands.

Further, the Office Action applies Leung for suggesting the use of base as a means to stabilize hydroformylation catalysts. Leung suggests free heterocyclic nitrogen compounds, such as the illustrative diazole compounds at col. 30, lines 18-40. However, claim 21 recites trialkyl amines, dialkyl aryl amines, alkyl diaryl amines, triaryl amines, and bases immobilized on a solid phase, but does not recite free heterocyclic nitrogen compounds. Moreover, Leung suggests phosphite ligands, but fails to suggest phosphoramidite compounds.

With regard to independent claim 22, the Office Action asserts that the PTBD solid phases suggested in Xu can reasonably be considered to correspond to a base immobilized on a solid phase. Xu suggests using polymer supported base for deprotionation of phenols and as scavengers for trapping unreacted excess starting phenol. Thus, Xu cannot reasonably be considered to be analogous art nor to be pertinent to the instant subject matter.

The newly applied citations to Moloy and Treciak are relied on for suggesting that Jackstell was not the first to prepare 1-pyrrolylphosphorus ligands nor the first to use such ligands for catalytic hydroformylation reactions. Billig is relied on for suggesting that it was known in the art to stabilize hydroformylation catalysts. Moloy, Treciak, and Billig are not applied in a manner to cure the deficiencies of Jackstell, Ahlers, Dennis, and Leung discussed above.

Claims 2-8, 10-12, 14, and 16-20 are in condition for allowance for their respective dependence on allowable claims 13 or 21, as well as for the separately patentable subject matter that each of these claims recites.

In view of the above, Applicants believe the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 13111-00038-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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